

GAIA SCIENCE ALERTS

Follow-up server manual



gaia

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last update: 10 January 2012

INTRODUCTION

Gaia Science Alerts Follow-up Server relies on alerts released via VOEvent at Skyalert.org webpage. For details on Skyalert please refer to Williams et al. 2009, ASPC, 411, 115 and presentations of Ashish Mahabal and Roy Williams available here:

<http://www.ast.cam.ac.uk/ioa/research/gsawg/index.php/Workshop2011:agenda>

DISCLAIMER

The calibration server is part of the Gaia Science Alerts WG follow-up pipeline and thus should be used only for activities related to the Gaia alerts verification and follow-up. For details please go to:

<http://www.ast.cam.ac.uk/ioa/research/gsawg>

HOW TO SET-UP CUSTOM ALERT FEED

go to page 12 if you want to skip this step



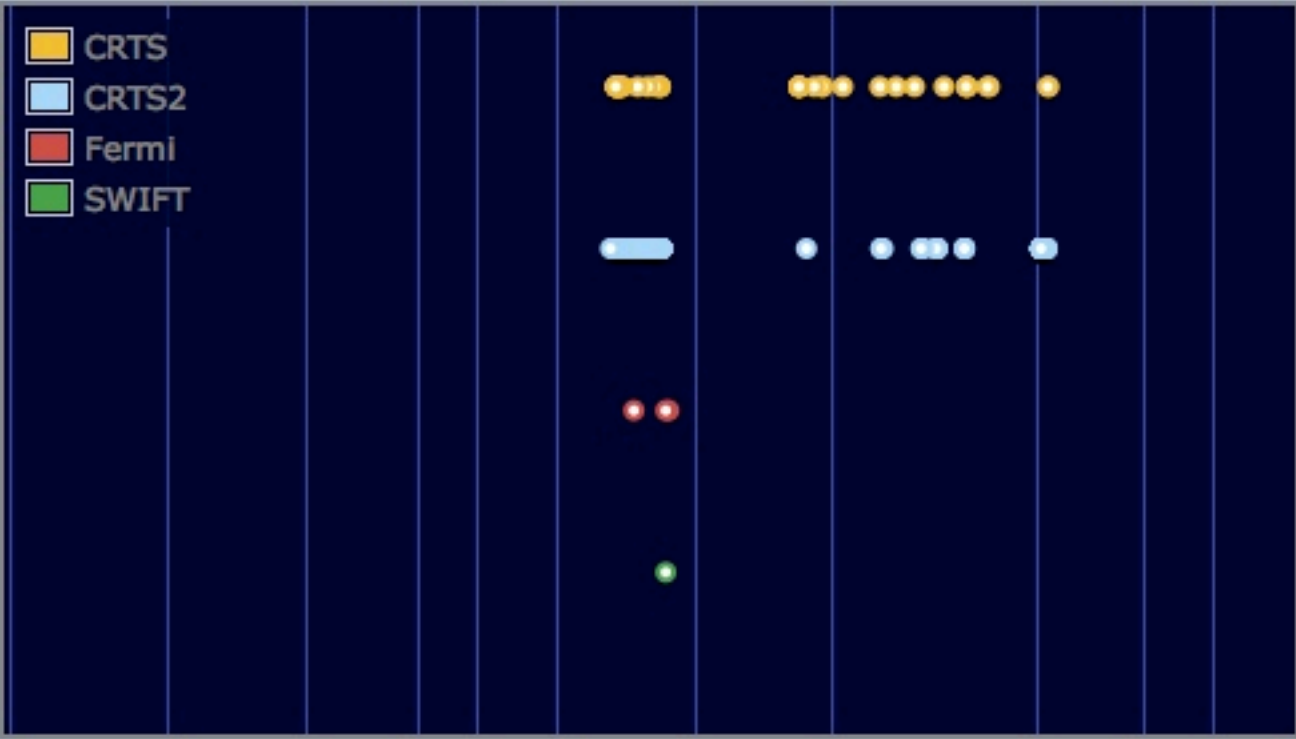
Skyalert.org

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[Browse Event Streams](#) | [Browse Skyalert Feeds](#) | [my Feeds and Alerts](#)

Log in [here](#), or register [here](#).

Recent Events

In the picture below, time is measured with "right now" at the right. Ages of recent events -- the last 200 received -- are shown by stream. Click on an event to bring up a new window with detailed portfolio.



month 2w week 4d 3d 2d day 12h 4h 2h hour 0.0
<-- Time since now (2011/11/18 8:09 PST)

Legend: CRTS (yellow), CRTS2 (light blue), Fermi (red), SWIFT (green)

The chart shows a timeline of astronomical events from month to 0.0 hours ago. CRTS events (yellow dots) are the most frequent, appearing in clusters. CRTS2 events (light blue dots) are also visible. Fermi events (red dots) and SWIFT events (green dots) are less frequent.

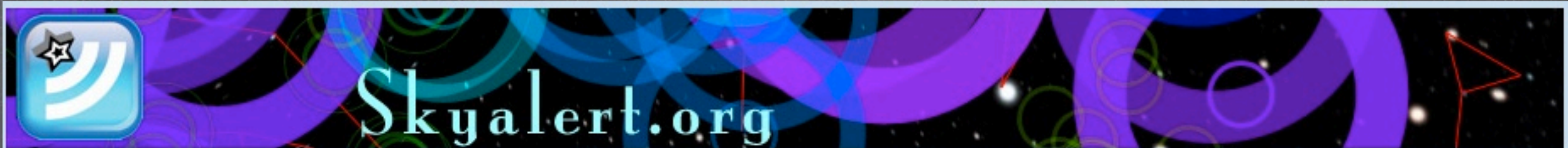
About Skyalert

SkyAlert collects and distributes astronomical **events** in near-real time. Each event belongs to a **stream** of events that come from a common source, with a common vocabulary of parameters for each event. You can browse event streams and the events themselves, at the links below. You can set up "alerts" which decide which events you find interesting, that comes with an [Atom feed](#) of those that pass the selection. You get only the events you want -- no more, no less.

- [Skyalert News](#)
- [Feeds of interesting astronomical events](#)
- [Browse event streams](#) that skyalert is monitoring
- [Recent events](#) as a table
- [Build a custom feed](#)
- [Get email when an interesting event occurs](#)
- [Authoring your own event stream](#)
- [Validate a VOEvent or author an event](#)
- [Resolve an event identifier \(IVORN\)](#)
- [Guide to Running Skyalert \(pdf\)](#)
- [Install your own Skyalert](#)
- Contact us at help@skyalert.org

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HOW TO SET-UP CUSTOM ALERT FEED



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[Browse Event Streams](#) | [Browse Skyalert Feeds](#) | [my Feeds and Alerts](#)

Sign up

Create an account


First name:	<input type="text"/>
Last name:	<input type="text"/>
Username:	<input type="text"/>
Email address:	<input type="text" value="wyrzykow"/>
Password:	<input type="password" value="....."/>
Password again	<input type="password"/>
Click when finished:	<input type="button" value="Register →"/>

Fill out the form to the left (all fields are required), and your account will be created; you'll be sent an email with instructions on how to finish your registration.

We'll only use your email to send you signup instructions. We hate spam as much as you do.

This account will let you subscribe to event streams for future notifications.

HOW TO SET-UP CUSTOM ALERT FEED



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Log in

Log in

Username:

Password:

If you don't have an account, you can [sign up](#) for one.

HOW TO SET-UP CUSTOM ALERT FEED



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[Browse Event Streams](#) | [Browse Skyalert Feeds](#) | [my Feeds and Alerts](#)

Logged in as: wyrzykow
(Lukasz Wyrzykowski)
([logout](#))

Recent Events

In the picture below, time is measured with "right now" at the right. Ages of recent events -- the last 200 received -- are shown by stream. Click on an event to bring up a new window with detailed portfolio.



month 2w week 4d 3d 2d day 12h 4h 2h hour 0.0
<-- Time since now (2011/11/18 8:06 PST)

Legend:
CRTS (yellow square)
CRTS2 (light blue square)
Fermi (red square)
SWIFT (green square)

The chart shows a timeline of astronomical events from month to 0.0 hours ago. CRTS events (yellow dots) are the most frequent, appearing in clusters. CRTS2 events (light blue dots) are also visible. Fermi (red dots) and SWIFT (green dots) events are less frequent.

About Skyalert

SkyAlert collects and distributes astronomical **events** in near-real time. Each event belongs to a **stream** of events that come from a common source, with a common vocabulary of parameters for each event. You can browse event streams and the events themselves, at the links below. You can set up "alerts" which decide which events you find interesting, that comes with an [Atom feed](#) of those that pass the selection. You get only the events you want -- no more, no less.

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[Browse Event Streams](#) [Browse Skyalert Feeds](#) [my Feeds and Alerts](#)

HOW TO SET-UP CUSTOM ALERT FEED

For a New Alert

[Click Here](#)

Existing Alerts

Here are your existing alerts:
Click the "detail" to view and edit.

Bright CBAT	(detail)	(feed)	(json)	(delete)	CBAT["mag"]<17
Catalina SNe	(detail)	(feed)	(json)	(delete)	(CRTSCircular["First"]["eventClass"]=="Supernova") and (CRTS["First Detection params"]["magnitude"]<17)

[Back to main page](#)

Select the main stream of alerts:

Choose the primary stream

This is the event stream that is the basis of your alert. You can build a trigger (i.e. r
Choose the primary stream -->

You can also have extra conditions for your alert, based on the presence of additional
advanced option. [click](#)

Continue to next step -->

- ✓ select stream...
- AAVSO
- CBAT
- CRTS
- CRTS2
- CRTS3
- CSS_NEO
- Fermi
- Gaia
- GALEX
- HST_MCT
- MOA
- OGLE
- PI_OF_SKY
- POSS
- SWIFT
- Test

CRTS: Northern Hemisphere
CRTS2: Asteroids
CRTS3: Southern Hemisphere

Gaia: in future...

Select the secondary stream of alerts:

Choose the primary stream

This is the event stream that is the basis of your alert. You can build a
Choose the primary stream --> CRTS

You can also have extra conditions for your alert, based on the presence of
This is an advanced option. [click](#)

Choose secondary streams -->

Continue to next step -->

- select stream...
- CatalogArchives
- constellation
- CRTSCircular

CRTSCircular contains classification results

HOW TO SET-UP CUSTOM ALERT FEED

Alert Detail

for the alert named **CRTS SNe North**

Primary Stream: [CRTS \(ivo://nvo.caltech/voeventnet/catot\)](#)

Secondary Stream: [CRTSCircular \(ivo://nvo.caltech/voeventnet/CRTSCircular\)](#)

Name of Alert:

Active alert?:

Action type:

Action detail:

Private alert?:

What can I do here?

You can create a decision trigger in the box below, which is an expression that evaluates to true or false, for example `SWIFT["Dec"] > 70`, which is true only for events from the SWIFT stream whose declination is greater than 70. When an event comes in, it is run immediately against your trigger, and if it passes, then the action is executed. Currently the only action available is sending email ("alert_email"). Another decision formula might be `CATOT["First Detection params"]["magnitude"] < 18` to select by magnitude.

How to make an alert:

- **Step 1:** Give your alert a name, and make sure the email address is correct. Click the **Save** button.
- **Step 2:** Change the default trigger ("True") to the criterion you want. Clicking on the **red dots** by names of parameters will insert the correct code. Make sure your expression is a boolean expression.
- **Step 3:** Click "Save"
- **Step 4:** Click on "See Events" to see which historical events satisfy your trigger.

Trigger Expression

`(CRTSCircular["First"]["eventClass"]=="Supernova") and (CRTS["First Detection params"]["magnitude"]<18) and (CRTS["First Detection params"]["Dec"]>0)`

Your filter here

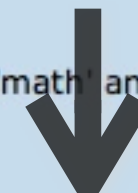
the list of possible parameters for both streams is available at the bottom of the page

This button first checks the syntax of the expression above, then saves the whole alert.

The form of the trigger is python syntax. Each event type (stream) is given a dictionary of its parameters. The 'math' and 'string' libraries are also available in trigger construction.

Step 3: Click to save -->

Click once, if no error, then proceed



Action: Private alert?:

What can I do here?

You can create a decision trigger in the box below, which is an expression that evaluates to true or false, for example `SWIFT["Dec"] > 70`, which is true only for events from the SWIFT stream whose declination is greater than 70. When an event comes in, it is run immediately against your trigger, and if it passes, then the action is executed. Currently the only action available is sending email ("alert_email"). Another decision formula might be `CATOT["First Detection params"]["magnitude"] < 18` to select by magnitude.

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- **Step 3:** Click "Save"
- **Step 4:** Click on "See Events" to see which historical events satisfy your trigger.

Trigger Expression

```
(CRTSCircular["First"]["eventClass"]=="Supernova") and (CRTS["First Detection params"]["magnitude"]<18) and (CRTS["First Detection params"]["Dec"]>0)
```

This button first checks the syntax of the expression above, then saves the whole alert.

The form of the trigger is python syntax. Each event type (stream) is given a dictionary of its parameters. The 'math' and 'string' libraries are also available in trigger construction.

Step 3: Click to save -->

This button lets you see past events that would satisfy your trigger, if executed now.

Note: you must "Save" the alert with the button above before using this function!.

Step 4: Click to see past events that satisfy this alert -->

Primary Stream: CRTS

Click on a **red dot** to insert that parameter into your Decision Formula above. When you are happy with the formula, click Save.

group	Name	UCD	dataType	Description
Skyalert Standard Parameters				
	RA [.]	pos.eq.ra	float	Right Ascension of event
	Dec [.]	pos.eq.dec	float	Declination of event
	positionalError [.]	stat.error;pos.eq	float	Positional error of event
	ISOtime [.]	time.epoch		Time (UTC) of event
	MJDtime [.]	time.epoch	float	Time (MJD) of event

HOW TO SET-UP CUSTOM ALERT FEED

Filter is ready.

Portfolios

This page lists event portfolios whose first event is from this stream.



those allowed by the trigger rule 'CRTS SNe North' from *wyrzykow* ((CRTSCircular["First"]["eventClass"]=="Supernova") and (CRTS["First Detection params"]["magnitude"]<18) and (CRTS["First Detection params"]["Dec"]>0))

Click on the column header to sort. Table rows with gray background represent "test" events that do not represent anything in the sky.


detail meta.link	IVORN meta.id	RA pos.eq.ra deg	Dec pos.eq.dec deg	ISOtime time.epoch	Magnitude phot.mag;em.opt.R
detail	1110061400064119848	21.09311	40.39894	2011-10-06T08:41:34	17.266001
detail	1110061400024114478	7.32271	40.21338	2011-10-06T07:55:51	16.399099
detail	1110061320094139400	27.71469	33.43934	2011-10-06T07:17:51	15.320900
detail	1110061260014124074	1.33747	26.82104	2011-10-06T04:13:15	17.754499
detail	1110061381024104474	356.03657	36.80955	2011-10-06T03:33:33	13.499000
detail	1110061400994118958	0.05187	40.25335	2011-10-06T03:34:21	16.243401
detail	1110041231084160493	326.91002	24.76496	2011-10-04T03:29:00	13.095100
detail	1110031010314135324	85.39584	1.61888	2011-10-03T10:31:16	15.463400
detail	1110031010314155163	86.49273	2.35178	2011-10-03T10:31:16	14.476900
detail	1110011010184115318	48.67884	1.144	2011-10-01T09:37:28	17.697901
detail	1109281260024143595	5.20995	28.19164	2011-09-28T09:57:55	13.314600
detail	1109281210064142587	17.46047	22.40955	2011-09-28T09:27:52	13.341000
detail	1109251210404110806	117.07339	20.36483	2011-09-25T12:03:04	13.236600
detail	1109241260094142575	26.53255	27.99862	2011-09-24T10:40:14	13.490900

PICKING AN EVENT


...from emailed alert:

SkyAlert event CRTS#65193 (16.477690, -12.346840) Inbox | X  

☆ from **SkyAlert** help@skyalert.org [hide details](#) 17 Nov (1 day ago) ↩ Reply ▼
via [ast.cam.ac.uk](#)

sender time Sent at 10:08 (UTC). Current time there:
16:36. 

to wyrzykow@ast.cam.ac.uk
date 17 November 2011 10:08
subject SkyAlert event CRTS#65193 (16.477690, -
12.346840)

Skyalert email about event CRTS#65193
At 2011-11-17T04:51:09, RA,Dec = (16.477690,-12.346840) 
The portfolio around this event is at <http://skyalert.org/events/65193>
The trigger observation alone is here: <http://skyalert.org/event/121996>
The XML for the trigger observation is here: <http://skyalert.org/event/xml/121996>
Your alert named 'Catalina SNe' was the cause of this message with this trigger condition:
(CRTSCircular["First"]["eventClass"]=="Supernova") and (CRTS["First Detection params"]["magnitude"]
<17)

(A real-time action, such as this message, occurs when the trigger condition is true *because* of the
trigger event, but is not true without it).

To cancel these alerts, go to <http://skyalert.org/rules/> and change/delete your alerts. You will have to
login. Or just write help@skyalert.org

↩ Reply → Forward

PICKING AN EVENT

...from Skyalert.org directly:

Streams

Here are the streams known to Skyalert. Click the Detail link to view or edit the stream. Some streams have first-class events that can have other events associated to form a 'portfolio'. Click the All Events link to see all the events from the stream, and pointers to any portfolios of which they are members.

Stream Name Streams Portfolios Description

AAVSO	(Stream)	(Portfolios)	AAVSO Alerts & Special Notices
CBAT	(Stream)	(Portfolios)	Reports of possible discoveries of novae, supernovae, and new variable stars.
CRTS	(Stream)	(Portfolios)	Catalina Real-time Transient Survey
CRTS2	(Stream)	(Portfolios)	CRTS 1.5m Transients
CRTS3	(Stream)	(Portfolios)	CRTS Siding Spring Transients
CSS_NEO	(Stream)	(Portfolios)	Report of a moving object found by the Catalina Sky Survey
Fermi	(Stream)	(Portfolios)	Fermi events



Portfolios

This page lists event portfolios whose first event is from this stream.

Events from stream [CRTS](#)

Click on the column header to sort. Table rows with gray background represent "test" events that do not represent anything in the sky.

detail meta.link	IVORN meta.id	RA pos.eq.ra deg	Dec pos.eq.dec deg	ISOtime time.epoch	Magnitude phot.mag;em.opt.R
detail	1111181120424127237	118.19689	12.37233	2011-11-18T12:23:46	16.657801
detail	1111181070424172387	118.28164	8.09614	2011-11-18T12:22:08	18.364100
detail	1111181230384140281	115.13648	24.15011	2011-11-18T10:52:35	18.574400
detail	1111181120414105186	115.5717	11.46381	2011-11-18T10:49:18	13.391700
detail	1111181120274120028	74.74802	12.05281	2011-11-18T10:09:56	16.465099
detail	1111181120284107174	77.83725	11.5787	2011-11-18T10:12:22	17.332100

PICKING AN EVENT

Portfolio ivo://nvo.caltech/voeventnet/catot#1111181120424127237

From the [CRTS](#) stream.

Catalina Real-time Transient Survey

Position is 118.19689,12.37233 \pm 0.0012

This portfolio initiated 2011-11-18 05:32:05

Also available is the [JSON representation of this portfolio](#).

Each event of the portfolio can be shown as Overview, Params, or XML. Click at the left to select the view.

[Overview](#)

[Params](#)

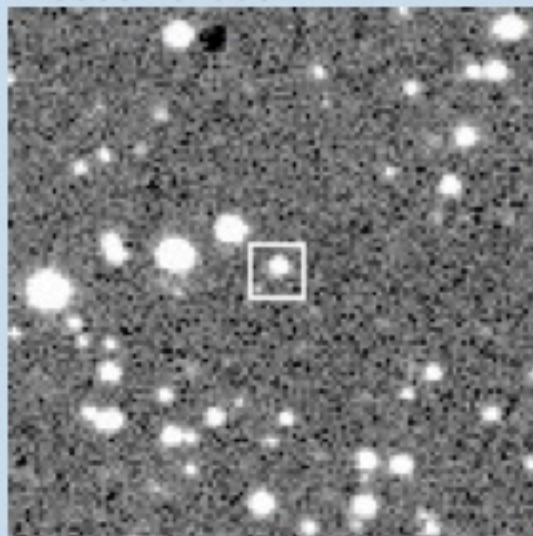
[XML](#)

[None](#)

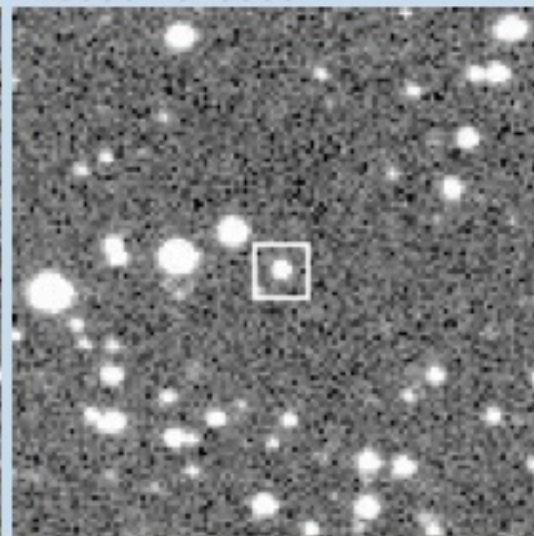
CRTS (Catalina/Mt Bigelow)

Event identifier is 1111181120424127237 or CSS111118:075247+122220

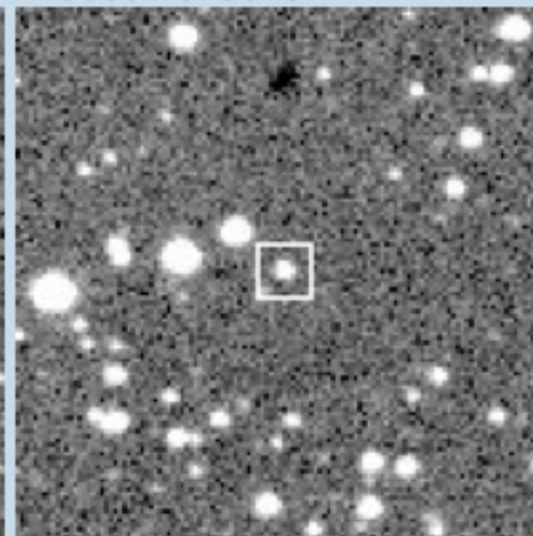
2455884.019367



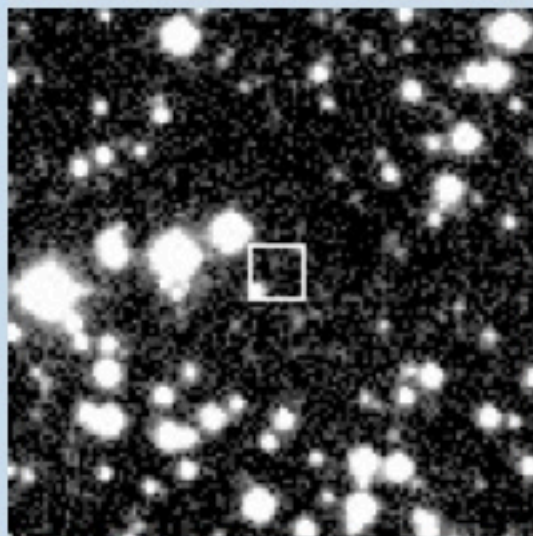
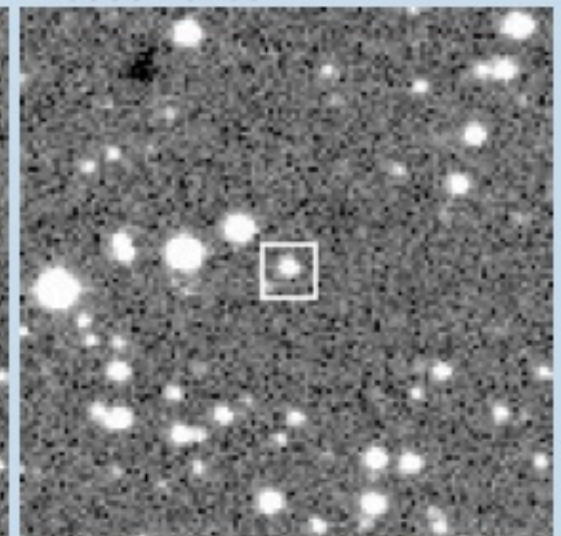
2455884.010803



2455884.013648



2455884.016514



Reference

Finding Chart [Click here](#)

Past CRTS images [Click here](#)

Other images [Click here](#)

Lightcurve [Click here](#)

SDSS cutout [Click here](#)

Position (118.19689,12.37233)

Time 2011-11-18T12:23:46 (MJD 55883.5165046)

Magnitude 16.647400

Magnitude 16.641899

Magnitude 16.676500

Magnitude 16.657801

PICKING AN EVENT

Click on the points for associated images

Values for object: 1111181120424127237

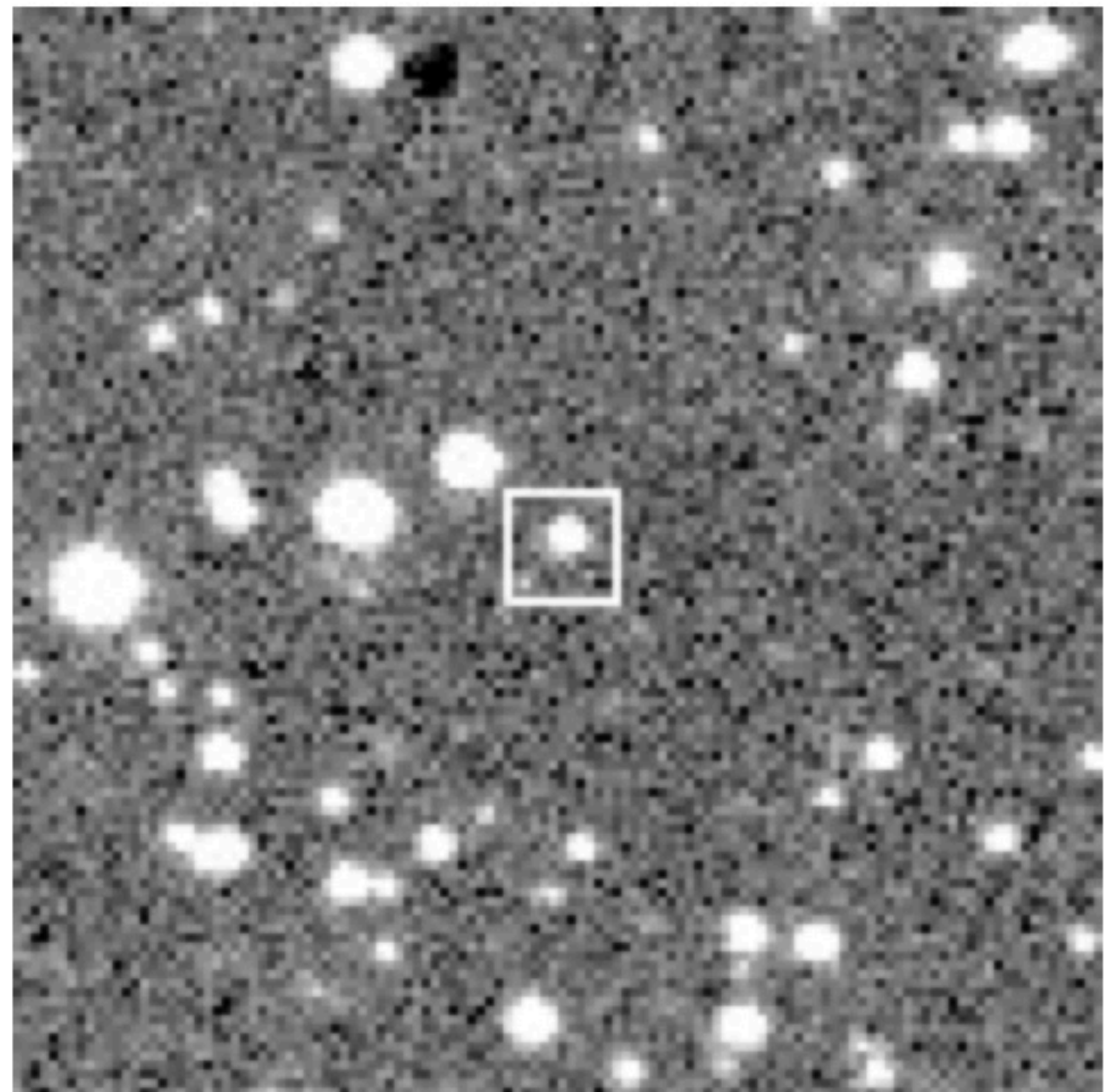
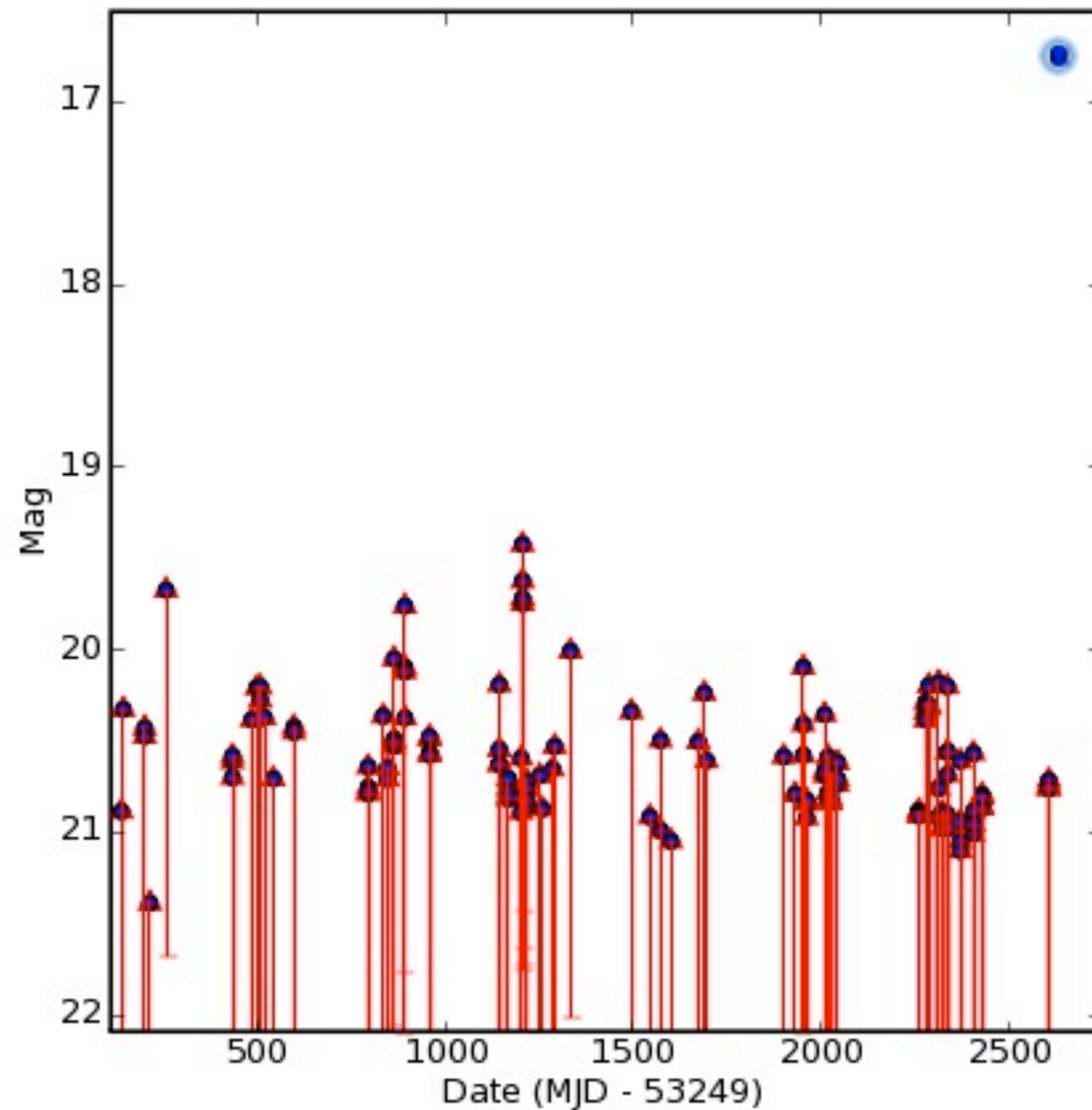
Date: 2634.439941 (2011-11-18)

Mag: 16.75375

Error: 0.033628

Red points upper limits

Blue points measurements



OBSERVING AN EVENT

Here we rely on the experience of the observers on:

- exposure time
- what filters to use
- photometry/spectroscopy

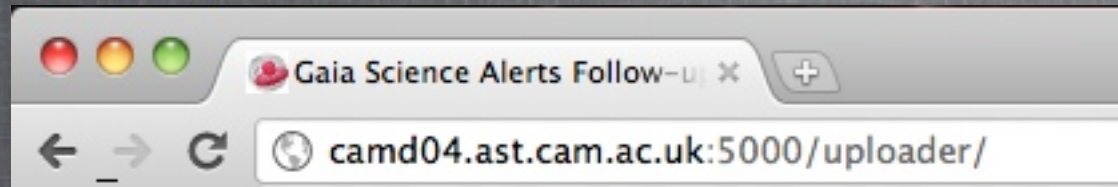
REQUIREMENTS ON DATA REDUCTIONS (photometry):

- Bias, Dark, Flat-field
- WCS
- SExtractor



Loiano Observatory, Italy

UPLOADING THE FOLLOW-UP DATA



Follow-up Data Uploading Form

Event ID:

Hash tag:

MJD OBS:

Exposure time (sec):

Filter (ignored):

SExtractor catalog: 110610_B.cat

Matching radius:

Force filter:

Dry Run: ☒



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Portfolio **ivo://nvo.caltech/voeventnet/catot#1111181120424127237**

From the [CRTS](#) stream.
Catalina Real-time Transient Survey
Position is 118.19689, 12.37233 ± 0.0012
This portfolio initiated 2011-11-18 05:32:05
Also available is the [JSON representation of this portfolio](#).

only alerts present in the database can be calibrated
if the event is not there it can be added manually - see later

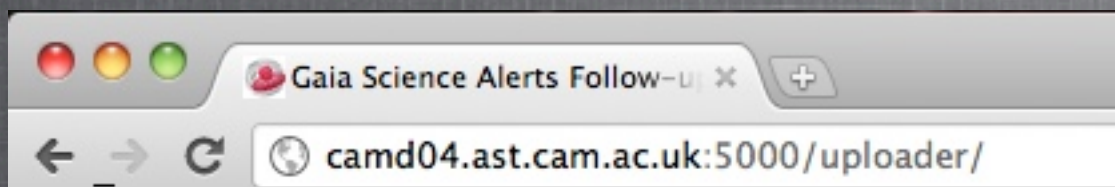
Gaia Science Alerts Calibration Server

List of alerts currently in the database:

id	IVORN	Ra	Dec	N_follow-up
1	ivo://nvo.caltech/voeventnet/catot#1111221010224122680	59.71914	1.55959	-
2	ivo://nvo.caltech/voeventnet/catot#1111221210174135477	49.69022	21.57691	-

Your unique access name / pass
(provided by Cambridge)

UPLOADING THE FOLLOW-UP DATA



Follow-up Data Uploading Form

Event ID:

Hash tag:

MJD OBS:

Exposure time (sec):

Filter (ignored):

SExtractor catalog:

Matching radius:

1 arcsec
✓ 2 arcsec
4 arcsec
6 arcsec

No (automatic)

Force filter: ☐

Dry Run: ☒

for SDSS there are also standard filters available (B,V,I,R) (conversion following Jordi et al. 2006)

REQUIRED SEXTRACTOR FIELDS:

ALPHA_J2000 Right ascension of barycenter (J2000) [deg]
DELTA_J2000 Declination of barycenter (J2000) [deg]
then, either:
MAG_APER Fixed aperture magnitude vector [mag]
MAGERR_APER RMS error vector for fixed aperture mag. [mag]
or:
MAG_AUTO Automatic aperture magnitude [mag]
MAGERR_AUTO RMS error for automatic aperture mag. [mag]

Maximum distance allowed for cross-matching your objects with the db (reflects the astrometric accuracy)

Output filter:
select the best matching filter to your filter or select "No" to find the best matching

Selecting "Dry Run" prevents data from being stored in the database. It allows for submitting the same data many times (e.g. for filter testing)
Don't forget to submit the data after the tests!

RESULT OF CALIBRATIONS

Hi AnonymousFollowUpAccount!

Upload done from IP 131.111.70.231

EventId : ivo://nvo.caltech/voeventnet/catot#1111171350514136075

Ra : 171.9954

Dec : 36.34131

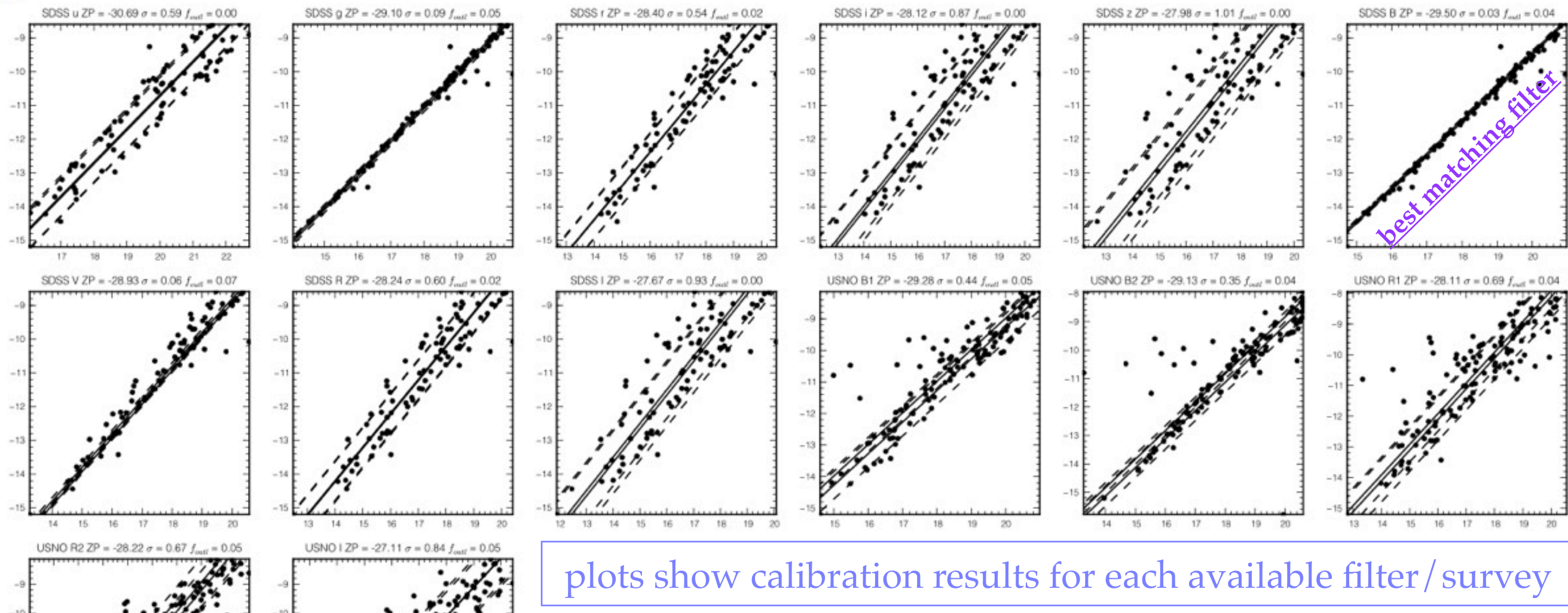
Filter: SDSS / B ← best matching filter (data will be stored as in this filter)

Magnitude: 19.4128163479 +/- 0.0133 mag ← calibrated magnitude

ZP: -29.50 mag ← zero point

Scatter: 0.03 mag

Plots:



plots show calibration results for each available filter / survey

RESULT OF CALIBRATIONS

Your observation is successfully stored in the GaiaFollowUpDB.
All data and list of all alerts can be accessed from the link on the main page

Follow-up Data Uploading Form

Event ID:

Gaia Science Alerts Calibration Server

List of alerts currently in the database:

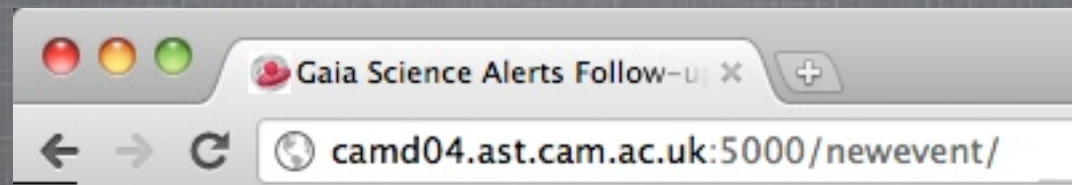
id	IVORN	Ra	Dec	N_follow-up
1	ivo://nvo.caltech/voeventnet/catot#1111221010224122680	59.71914	1.55959	-
2	ivo://nvo.caltech/voeventnet/catot#1111221210174135477	49.69022	21.57691	-
13	ivo://nvo.caltech/voeventnet/catot#1111181230384140281	115.13648	24.15011	-
14	ivo://nvo.caltech/voeventnet/catot#1111181120414105186	115.5717	11.46381	-
15	ivo://nvo.caltech/voeventnet/catot#1111181120274120028	74.74802	12.05281	3

#MJD	obs_id	calib_error	catalog_id	filter_id	mag	mag_err
55891.956574		1	0.0540921		1	2 17.4923 0.0039
55891.967014		1	0.153242		1	3 17.1323 0.0056
55891.967014		2	0.153242		1	3 17.1323 0.0056

work in progress...

ADDING NEW EVENT TO THE LIST

The list of events is regularly updated from Skyalert.org,
but if you still want to add a new event go to:



Creating New Event Form:

Hash password:

Event ID:

RA:

Dec:

URL:

TO DO LIST

- Automatically submit the follow-up data back to Skyalert.org as an annotation
- Plotting light curves of already observed events on the web
- Expand the web interface, e.g. add scrollable list of events